

**TITLE: SWL12\_Bottle\_data\_README.docx**

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**ORIGINAL AWARD TITLE:** (1) "Benthic carbon cycling and ecosystem structure in the northern Bering and Chukchi Seas" (NOAA) and (2) "Collaborative Research: The Distributed Biological Observatory (DBO)-A Change Detection Array in the Pacific Arctic Region" (NSF)

**DATA ARCHIVE:** DBO data archive link: <http://dbo.eol.ucar.edu/>

#### **DATASET OVERVIEW:**

This dataset includes measurements of water samples collected at hydrographic stations from the annual Canadian Coast Guard Service Sir Wilfrid Laurier cruise during July 2012. The top row indicates the PI or organization responsible for the data collection. Data includes by column, Cruise, Cast No., DBO Line, DBO station name, Station Number (#), Historical station Name, Date and time (UTC) (yy/mm/dd), UTC time (hh:mm), LAT=Latitude (°N), and LONG=longitude (°W), water depth (m), Cast depth (m), Sample Number, Rosette Bottle #, bottle trip location, raw CTD data (pressure, temperature (°C), Salinity, dissolved oxygen from uncalibrated CTD sensor, Chlorophyll (chl) a filtering volume, extraction volume, ChlT=chlorophyll value, and UMCES nutrient values (Nitrite+Nitrate, Silicate, Phosphate, Ammonia), and Oxygen-18/16 ratios. Additional parameters in the columns from sensors and data descriptors are provided in this file and defined below.

#### **INSTRUMENT DESCRIPTION:**

Water samples were collected from rosette bottles attached to a Seabird Model SBE19 CTD for nutrients, chlorophyll and oxygen-18/16 ratios. Water temperature, salinity, and other data that were electronically measured with sensors on the CTD are also provided for the depths where each bottle was closed.

#### **DATA COLLECTION AND PROCESSING**

Water column collections included water sampling for inorganic nutrients, dissolved oxygen, oxygen-18/16 ratios of seawater, and chlorophyll a at up to 6 depths at each station from the rosette bottles. Sensor data for temperature and salinity are also included. Subsamples for inorganic nutrients were collected from the CTD rosette, filtered shipboard, and frozen for post cruise analyses. Nutrient samples were processed at the Nutrient Analytical Services Laboratory (NASL) at the Chesapeake Biological Laboratory (CBL; <http://nasl.cbl.umces.edu/>) at the University of Maryland Center for Environmental Science (UMCES). Samples were processed for all 4 nutrients: nitrite + nitrate (NO<sub>2</sub>+NO<sub>3</sub>), silica (SiO<sub>4</sub>), phosphate (PO<sub>4</sub>), and to a limited extent, ammonium (NH<sub>4</sub>). Water samples for <sup>18</sup>O/<sup>16</sup>O ratios were collected in small vials, sealed to prevent evaporation and returned for analysis. These samples were analyzed at

the University of Maryland Center for Environmental Science using a Thermo DeltaPlus Stable Isotope Mass Spectrometer coupled to a Gasbench peripheral. Data are reported in the delta notation relative to Vienna Standard Mean Ocean Water (V-SMOW). The water column chlorophyll was analyzed shipboard using a Turner Designs AU-20 fluorometer (non-acidification or Welschmeyer method) following a 24-hour in the dark incubation with 90% acetone at 4°C method (see Cooper et al. 2012, 2013 for further details).

Data File Structure:

File Names (Formats): **SWL12 Bottle data.xls**

Files Data Parameters by Column:

Top of each column = responsible lead PI

A	Cruise
B	Cast No.=Cast number
C	DBO Line
D	DBO Station Name or Region=DBO Bounding Box (see EOL DBO site for coordinates)
E	Historical Station Name
F	place holder
G	Cast start time [UTC]
H	Latitude in decimal degrees
I	Longitude in decimal degrees
J	Water depth (m)
K	Cast depth [m]
L	Raw pressure [dbar]
M	Sample # [All others match to this sample number]
N	Bottle integrity [0=good, 1=leak, 2=bad]
O	Tripping direction (downcast or upcast) [US (up stop), UN (up no stop), USM (up stop mix) or DN (down no stop)]
P	Rosette bottle No. (Number)
Q	CTD Salinity 0
R	CTD Salinity 1
S	SBEox (mL/L) (Dissolved oxygen sensor on CDT, uncalibrated)
T	Sigma-t
U	Scan
V	T0 90C (Temperature sensor 1; °C)
W	T1 90C(Temperature sensor 2; °C)
X	Xmiss=Transmissometer
Y	FLSP (fluorescence, uncalibrated)
Z	Alt M=Altimeter (meters)
AA	Chlorophyll (chl) filtered volume
AB	Extracted volume (L)
AC	ChITOT [µg/L]
AA	Nitrate+Nitrite [µM]
AB	Silicate [µM]
AC	Phosphate [µM]
AD	Ammonium [µM] Analyzed at the University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory
AE	O18 [‰ VSMOW]

Data Version Number and Date: Version 2, 07/09/2015

## REFERENCES

Cooper, L.W., M.A. Janout, K.E. Frey, R. Pirtle-Levy, M.L. Guarinello, J.M. Grebmeier, and J.R. Lovvorn. 2012. The relationship between sea ice break-up, water mass variation, chlorophyll biomass, and sedimentation in the northern Bering Sea. *Deep Sea Research Part II* 65, 141-162; doi:10.1016/j.dsr2.2012.02.002.

Cooper, L.W, M.G. Sexson, J.M. Grebmeier, R. Gradinger, C.W. Mordy, J.R. Lovvorn. 2013. Linkages Between Sea Ice Coverage, Pelagic-Benthic Coupling and the Distribution of Spectacled Eiders: Observations in March 2008, 2009 and 2010 from the Northern Bering Sea, *Deep Sea Research Part II, Topical Studies in Oceanography*, 94, 31-43.